path	W	Q	ΔE_{int}	ΔS
p-constant	$p\Delta V$	$nC_p\Delta T$	$nC_V\Delta T$	$nC_p \ln(T_f/T_i)$
V-constant	0	$nC_V\Delta T$	$nC_V\Delta T$	$nC_V \ln(T_f/T_i)$
T-constant	$nRT\ln(V_f/V_i)$	W	0	$nR\ln(V_f/V_i)$
S-constant	$-nC_V\Delta T$	0	$nC_V\Delta T$	0
line	$\frac{1}{2}(p_f+p_i)\Delta V$	$W+\Delta E$	$nC_V\Delta T$	$nC_p\ln(V_f/V_i)+nC_V\ln(p_f/p_i)$
free	0	0	0	$nR\ln(V_f/V_i)$
cycle	area	area	0	0

Note: $nR\Delta T = p_fV_f - p_iV_i$

$$C_p = C_V + R \qquad C_V = \frac{f}{2}\,R \qquad \gamma = \frac{C_p}{C_V} = \frac{f+2}{f}$$